UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/438,184	11/11/1999	RON MCCABE	1735.2.2	8995

23484   7590   05/22/2003

JOHN W L OGILVIE
COMPUTER LAW
1211 EAST YALE AVE
SALT LAKE CITY, UT 84105

EXAMINER
DINH, DUNG C

ART UNIT	PAPER NUMBER
2153	

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Applicati n No.	**Applicant(s)**
Office Action Summary	09/438,184	MCCABE ET AL.
	Examiner	**Art Unit**
	Dung Dinh	2153

-- *The MAILING DATE f this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>03 March 2003</u> .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4) ☒ Claim(s) *1-88,101,103,104,106,108 and 109* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-88,101,103,104,106,108 and 109* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Infomal Patent Application (PTO-152)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ . 6) ☐ Other: .

DETAILED ACTION

Applicant's arguments filed March 3, 2003 have been fully

considered but they are not persuasive with respect to the 112

2nd rejection of claims 76-80.

Applicant asserted that the meaning of the term "flexible

mirroring characteristic" is clear from the reading of other

claims in the case. The argument is not persuasive because

claims 76-80 formed a separate group from the other claims.

Claims 76-80 must be definite and their meaning clear when read

in light of the specification and within the language of claims

76-80 - not from the reading of unrelated claims in the

application. Even if claims 76-80 are read in light of the

claims in the other set (e.g. like claim 1), one would still not

certain what is included or excluded from the language of claims

76-80.

Claims Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35

U.S.C. 112:

> The specification shall conclude with one or more claims particularly
> pointing out and distinctly claiming the subject matter which the applicant
> regards as his invention.

Claims 76-88 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite in that it fails to point out

what is included or excluded by the claim language. This is an

omnibus claim.

The term "flexible mirroring characteristic" in claim 76-80

is a relative term which renders the claim indefinite. The term

"flexible mirroring characteristic" is not defined in the claim,

the specification does not provide a standard for ascertaining

the requisite meaning of the term, and one of ordinary skill in

the art would not be reasonably apprised of the scope of the

invention. It is unclear what characteristic would be or would

not be construed as a "flexible mirroring characteristic."

Claims 81-88 are rejected because they are dependent upon

rejected claim 76.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. § 103(a) which
forms the basis for all obviousness rejections set forth in this
Office action:

> *(a) A patent may not be obtained though the invention is
> not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the
> subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject
> matter pertains. Patentability shall not be negatived by
> the manner in which the invention was made.*

Claims 1-88, 101, 103-104, 106, 108-109 are rejected under

35 U.S.C. 103(a) as being unpatentable over Staheli et al. US

patent 5,537,533 and further in view of Double-Take, and

FrameRunner.

As per claims 1-2, 4, 6-10, 15-19, 21-22, Staheli teaches a

data mirroring system with to remote storage location via a

journey line [col.12 lines 49-63], non-invasive characteristic by

which data is mirrored to remote location without remote mirroring

software on the host and disk emulation characteristic by which

the system mirrors data through a standard storage subsystem bus

[apparent from col.10 lines 22-35].

Staheli does not specifically disclose multiplicity

characteristic, serverless destination characteristic where the

remote mirroring unit is not attached to a remote server, and TCP

journey line to the remote mirroring unit.

FrameRunner teaches an improved data mirroring system by

using serverless destination (page 2 "No Host Intervention") where

the remote mirroring unit not connected to a dedicated server.

Mirrored data is send directly between storage units without the

host involvement. This improvement allows any type of computer

system to have mirroring capability with minimal impact to the

overal system performance. (See the last paragraph on page 2.)

Double-take teaches an improved data mirroring system by

having wide area network journey line to connect to remote

mirroring unit (p.7 Affordable - "Double-Take runs over existing

network links", p.9 Tolerant - "wide area connections ..."). It

is apparent that the wide area network uses TCP/IP, and that the

local unit would act as a client to send data and the remote unit

would act as a server to accept the data. It would have been

obvious to use TCP/IP because it would have enabled the system to

mirror data over existing wide are network such as the Internet.

Double-Take further teaches the improvement including multiplicity

characteristic in which the system provides many-to-one and one-

to-many mirroring, and daisy-chain configurations (see page 7

"Flexible" and page 13).

Hence, one of ordinary skill in the art would have been

motivated to combine the teaching of FrameRunner and Double-Take

to Staheli because it would have improved flexibility and enabled

the system to mirror data over existing wide area network.

As per claims 3, 5, 14, 20, 23, 24, Staheli teaches the local

server linked to a local mirroring unit, which is linked in turn

by the journey link to the remote mirroring unit [col.10 lines 36-

41]. Double-Take also teaches this feature on page 8 - a local

server linked to a local mirroring unit, which is lined by a

journey link (offsite link) to a remote mirroring unit (offsite).

Claims 11-13, official notice is taken that it is well known

in the art to use SCSI, fibre channel, and USB for storage

subsystem (see applicant admitted prior art on p.9, and US patent

6,386,683 col.3 line 61+). The type of bus used would clearly
have been a matter of design choice.

As per claim 26, Double-Take teaches a remote server
connected to the remote mirroring unit [page 8].

As per claims 27, 41, they are rejected under similar
rationale as for claim 1 above. It is apparent that system as
modified inludes plurality of primary severs and associated local
mirroring unit [Staheli col.14 lines 54-57]. Staheli teaches the
mirroring unit generating spoof packet [col.11 lines 19-25] and
has a nonvolatile data buffer 66 for mirrored data [col.13 lines
35-40], the local link include standard storage subsystem bus and
emulating a disk subsystem [col.10 lines 22-40]; and Double-Take
and FrameRunner teaches a remote mirroring unit destination
connected to a journey link (wide area network). It is apparent
that the remote mirror unit would also have nonvolatile storage
for storing mirrored data received over the journey link.

As per claims 46, 54, 55, 56, 58, 68, they are rejected for
similar rationale as for claim 27 above. Staheli teaches to
generate pre-acknowledgements indicating storage of mirrored data
in nonvolatile data buffer [col.15 lines 40-45]. Double-Takes
disloses the journey link has low bandwidth and high latency [page
9 Tolerant – "wide area network connections are slower, more
congested, and subject to for frequent failures"].

As per claim 28-29, 31, 34, 47, 49, 53, Double-Take teaches many-to-one mirroring configuration [page 13]. The reference does not specifically disclose providing a partition or a hard drive for each primary server. It would have been obvious for one of ordinary skill in the art to do so because it would have physically separate data mirrored from each of the primary servers. The usage of a partition, disk, or RAID as storage unit clearly would have been a matter of design choice depending upon the amount of storage capacity needed.

As per claims 30, 48, Staheli teaches the mirrored drive is bootable [see fig.2].

As per claims 32, 50, 51, 52 official notice is taken that it is well known in the art to have RAID that is hot-swappable and hardware/software for striping.

As per claim 33, it is apparent that the system as modified comprises plural primary servers with different operating system [see FrameRunner bottom of page 2 - UNIX, Windows NT, AS/400s].

Claims 35-37, 57, 65-67, official notice is taken that it is well known in the art to use SCSI, fibre channel, and USB for storage subsystem (see applicant admitted prior art on p.9, and US patent 6,386,683 col.3 line 61+). The type of bus used would clearly have been a matter of design choice.

As per claims 38-39, 63-64, official notice is taken that Ethernet and TCP connection are well known network protocol. The usage of either would have been a matter of design choice.

As per claims 42-45, 69-70, 72-73, it is apparent that the remote mirror units and primiary servers of the Staheli's system as modified can be ten or hundred of miles from each others.

As per claims 60-62, Staheli teaches the interface emulation acted like a conventional disk drive controller [col.10 lines 22-30]. Hence, it is apparent that the system can response to any disk command from the host including formatting, partitioning, and integrity check.

As per claim 71, it is inherent that the system as modified can be repeated to have other sets of primary server, local mirror, and remote mirror unit.

As per claims 74-75, 84, official notice is taken that is is well known in the art to to fully mirrored a volume and to resconstruct a disk volume as it existed at a previous time.

As per claims 76-80, they are rejected under similar rationale as for claim 1 above.

Claims 78 and 80, Double-take teaches one local server and at least two mirroring units [page 13 "one-to-many"].

Claim 79, Double-take teaches a local server, remote server and mirroring unit [page 8].

As per claim 81, official notice is taken that the usage of storage area network is well known in the art. It would have been obvious for one of ordinary skill in teh art to use storage area network because it would have enabled high performance and largre storage capacity.

As per claim 82, official notice is taken that network attached storage subsystem is well known in the art. FrameRunner disclose storage device directly communicate with each other over the network. Hence, it is apparent that the system as modified would have had network attached storage subsystem.

As per claim 83, it is apparent that the mirroring system of Staheli as modified is applicable to any computer that stores data to a hard disk including computer that is not functioning as a server.

As per claim 85, Staheli teaches not to generate pre-acknowledgments [col.14 line 25].

As per claim 86, mirroring data done by data fork below the disk emulation is apparent in the system as modified from the process of "one-to-many" mirroring. It is apparent that data received by the emulator is "forked" to plural mirroring units.

As per claim 87, official notice taken that is is well known in the art to implement buffer as a circular buffer with head and tail pointer. It would have been obvious for one of ordinary

skill in the art to use a circular buffer because it would have enable data to be continuously put into the buffer in sequence.

As per claim 88, Double-Take teaches a dual host connection [page 13 "Many-to-one" configuration].

As per claims 101-102, 104, 106, 108, they are rejected under similar rationale as for claim 1 above. Since the system as modified provide disk storage emulation to provide the appearance of a local storage device to the host computer, it is apparent that the host would transfer data as via storage system bus as if the device is a local storage device. Since the remote mirror storage is located in a remote serverless mirroring unit over the TCP/IP journey link, it is apparent that the emulator (e.g. local mirroring unit) would transmit data as packets over the TCP/IP link to the remote serverless mirroring unit.

As per the usage of Ethernet or TCP/IP, Double-Take teaches to make use of existing network; hence, the protocol used would have been a matter of design choice depending on the protocol used by the exisiting network.

As per claim 103, official notice is taken that is is well known to have storage device connected via SCSI bus. It would have been apparent that one would emulate a disk subsystem that used by the host including SCSI or any storage bus being used.

As per claim 109, it is apparent that a mirroring system would be switch over to a recovery state when data need to be recovered.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Dinh whose telephone number is (703) 305-9655. The examiner can normally be reached on Monday-Thursday from 7:00 AM - 4:30 PM. The examiner can also be reached on alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached at (703) 305-4792.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2100 Customer Service whose telephone number is (703) 306-5631.

Any response to this action should be mailed to:

    Commissioner of Patents and Trademarks
    Washington, DC 20231

or faxed to:

(703) 746-7239, (for formal communications intended for entry)
(703) 746-7240 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA, Fourth Floor (Receptionist).

Dung Dinh
Primary Examiner
May 14, 2003